

## 5 Claims

1. Aluminium alloy exhibiting high strength and low quench sensitivity having
  - 4.6 to 5.2 wt.% Zn
  - 2.6 to 3.0 wt.% Mg
  - 0.1 to 0.2 wt.% Cu
  - 0.05 to 0.2 wt.% Zr
  - max. 0.05 wt.% Mn
  - max. 0.05 wt.% Cr
  - max. 0.15 wt.% Fe
  - max. 0.15 wt.% Si
  - max. 0.10 wt.% Ti
- the remainder being impurities due to the manufacturing process, individually at maximum 0.05 wt.%, in total at maximum 0.15 wt.%.
  2. Aluminium alloy according to claim 1, characterised by way of 4.6 to 4.8 wt.% Zn.
  3. Aluminium alloy according to claim 1 or 2, characterised by way of 2.6 to 2.8 wt.% Mg.
  4. Aluminium alloy according to one of the claims 1 to 3, characterised by way of 0.10 to 0.15 wt.% Cu.
  5. Aluminium alloy according to one of the claims 1 to 4, characterised by way of 0.08 to 0.18 wt.% Zr.

6. Aluminium alloy according to one of the claims 1 to 5, characterised by way of a maximum concentration of 0.03 wt.% Mn.
- 5 7. Aluminium alloy according to one of the claims 1 to 5, characterised by way of a maximum concentration of 0.02 wt.% Cr.
8. Aluminium alloy according to one of the claims 1 to 7, characterised by way of a maximum concentration of 0.12 wt.% Fe.
- 10 9. Aluminium alloy according to one of the claims 1 to 8, characterised by way of a maximum concentration of 0.12 wt.% Si.
- 15 10. Aluminium alloy according to one of the claims 1 to 9, characterised by way of a maximum concentration of 0.05 wt.% Ti.
- 20 11. Process for manufacturing plates of thickness up to 300 mm out of an aluminium alloy according to one of the claims 1 to 10, characterised by way of the steps
  - A. Continuous casting the aluminium alloy as an ingot with a thickness greater than 300 mm,
  - B. Heating the ingot at a maximum heating rate of 20°C/h between 170 and 410°C to a temperature of 470 to 490°C,
  - 25 C. Homogenising the ingot for an interval of 10 to 14 h at a temperature of 470 to 490°C,
  - D. Hot rolling the homogenised ingot to plate,
  - E. Cooling the plate from a temperature of 400 to 410°C to a temperature of less than 100°C,
  - 30 F. Cooling the plate to room temperature
  - G. Artificially age-hardening the plate.

12. Process for manufacturing plate with a thickness of greater than 300 mm out of an aluminium alloy according to one of the claims 1 to 10 is characterised by way of the steps
  - 5 A. Continuous casting the aluminium alloy as an ingot with a thickness greater than 300 mm,
  - B. Heating the ingot at a maximum heating rate of 20°C/h between 170 and 410°C to a temperature of 470 to 490°C,
  - C. Homogenising the ingot for an interval of 10 to 14 h at a temperature of
    - 10 470 to 490°C,
    - D. Cooling the ingot to an intermediate temperature of 400 to 410°C,
    - E. Cooling the ingot from the intermediate temperature of 400 to 410°C to a temperature below 100°C,
    - F. Cooling the ingot to room temperature,
    - 15 G. Artificially age-hardening the ingot,
    - H. Use of the artificially age-hardened ingot as plate.
13. Process according to claim 12, characterised in that the cooling of the ingot from the homogenisation temperature of 470 – 490°C to the
  - 20 intermediate temperature of 400 – 410°C takes place in still air.
14. Process according to claim 11 or 12, characterised in that the cooling of the ingot from the intermediate temperature of 400 – 410°C to a temperature below 100°C takes place by forced air cooling.
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15. Process according to claim 11 or 12, characterised in that the cooling of the ingot from the intermediate temperature of 400 – 410°C to a temperature below 100°C takes place in a water-air-mist spray.
16. Process according to one of the claims 11 to 15, characterised in that the artificial age-hardening is carried out, after storage at room temperature, in a first heat-treatment at a first temperature, followed by a second heat-
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treatment at a second temperature which is higher than the first temperature.

- 5    17. Process according to claim 16, characterised by way of
- 1 – 30 days storage at room temperature,
  - 6 - 10 h at a temperature of 90 - 100°C
  - 8 – 22 h at a temperature of 150-160°C.
- 10   18. Process according to claim 17, characterised in that the artificial age-hardening is carried out resulting in a heat-treatment condition T76.
- 15   19. Use of a plate manufactured by the process according to one of the claims 11 to 18 for machine, tool and mould production, in particular for plastic injection moulding moulds.

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